

*Fig. 1*

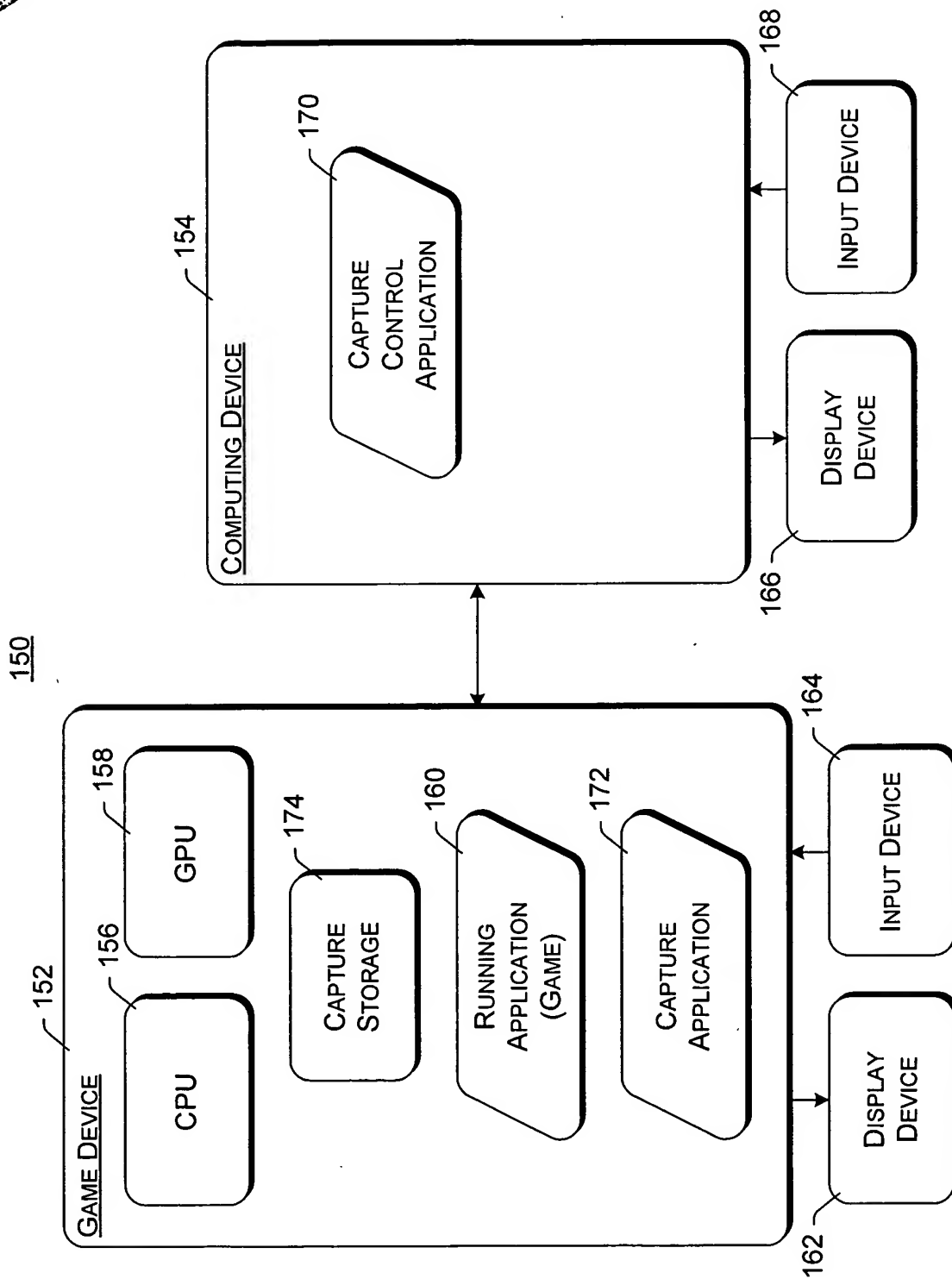
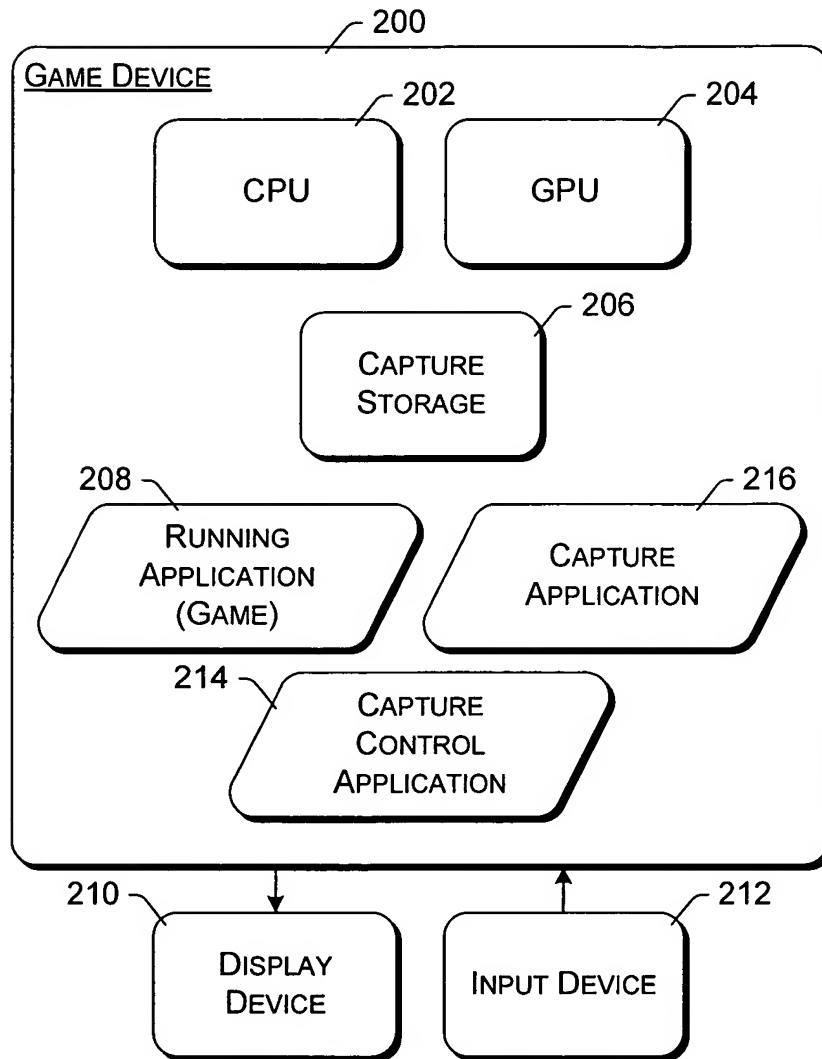


Fig. 2



*Fig. 3*



240

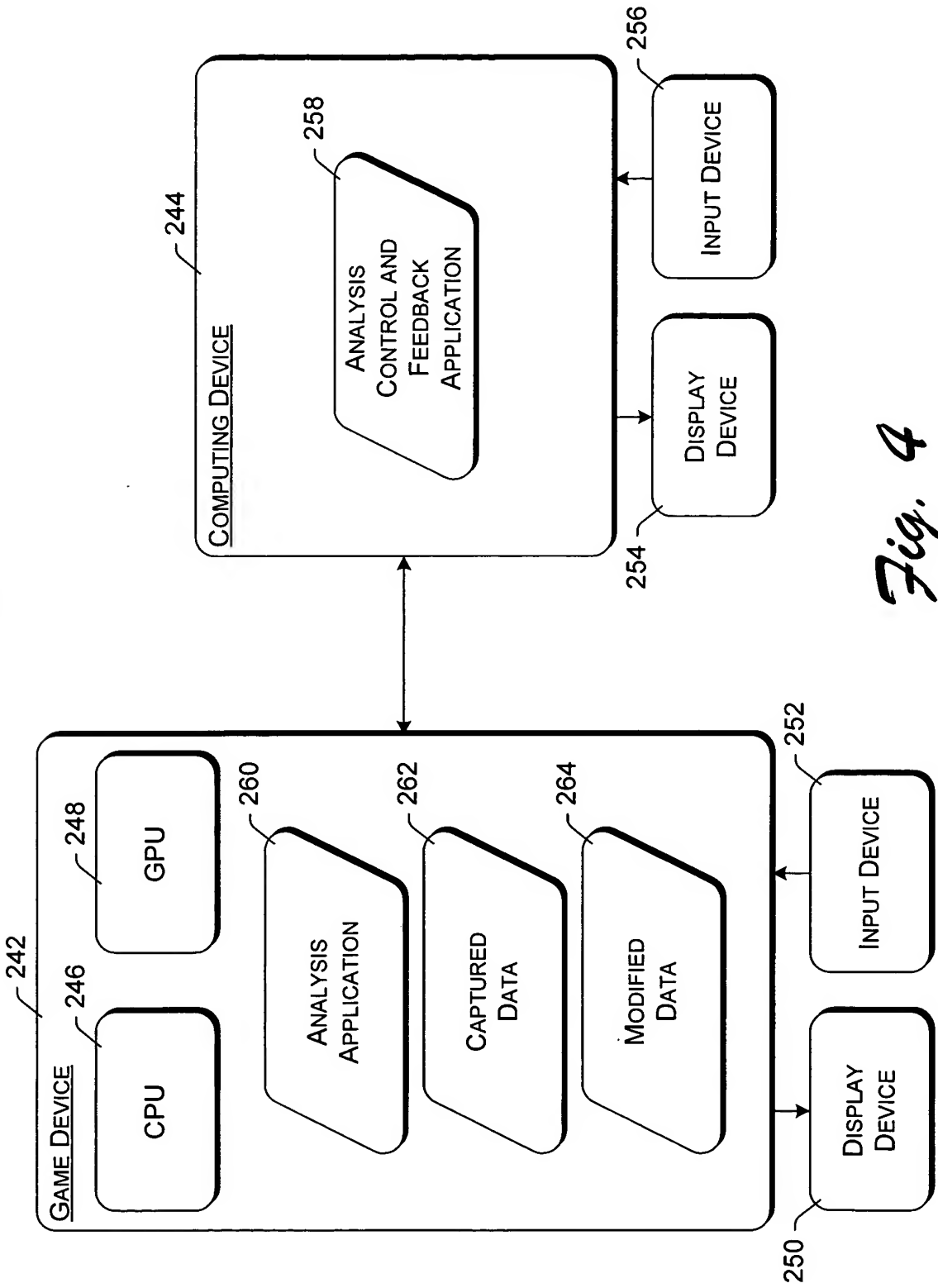
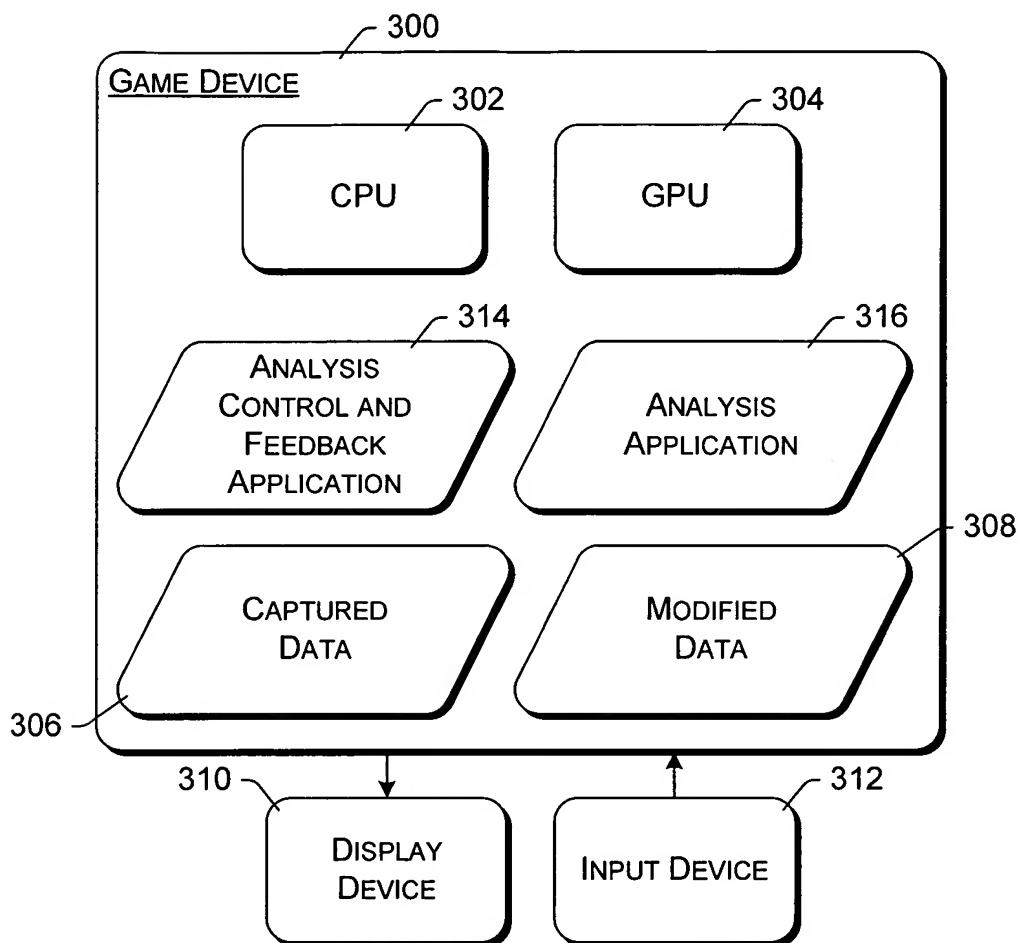


Fig. 4



*Fig. 5*

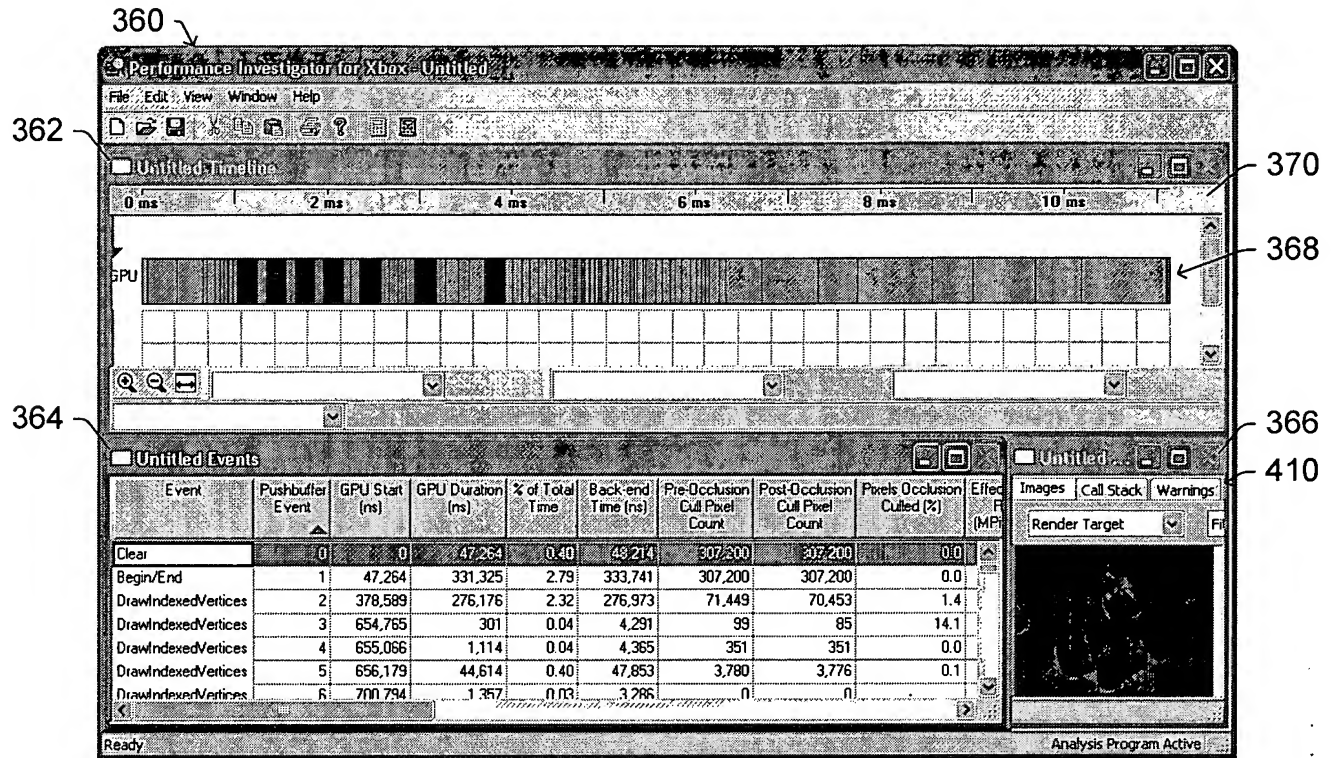


Fig. 7

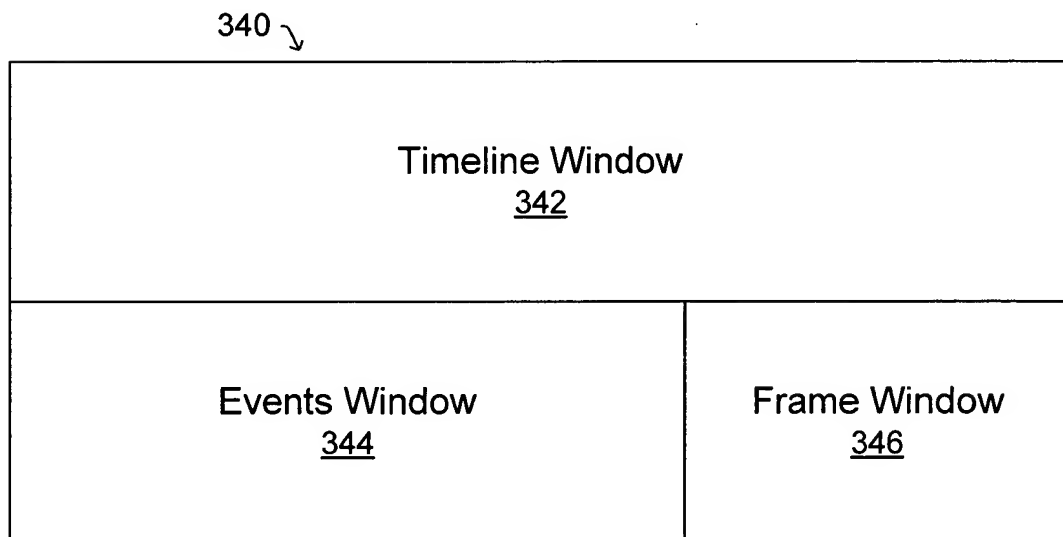


Fig. 6

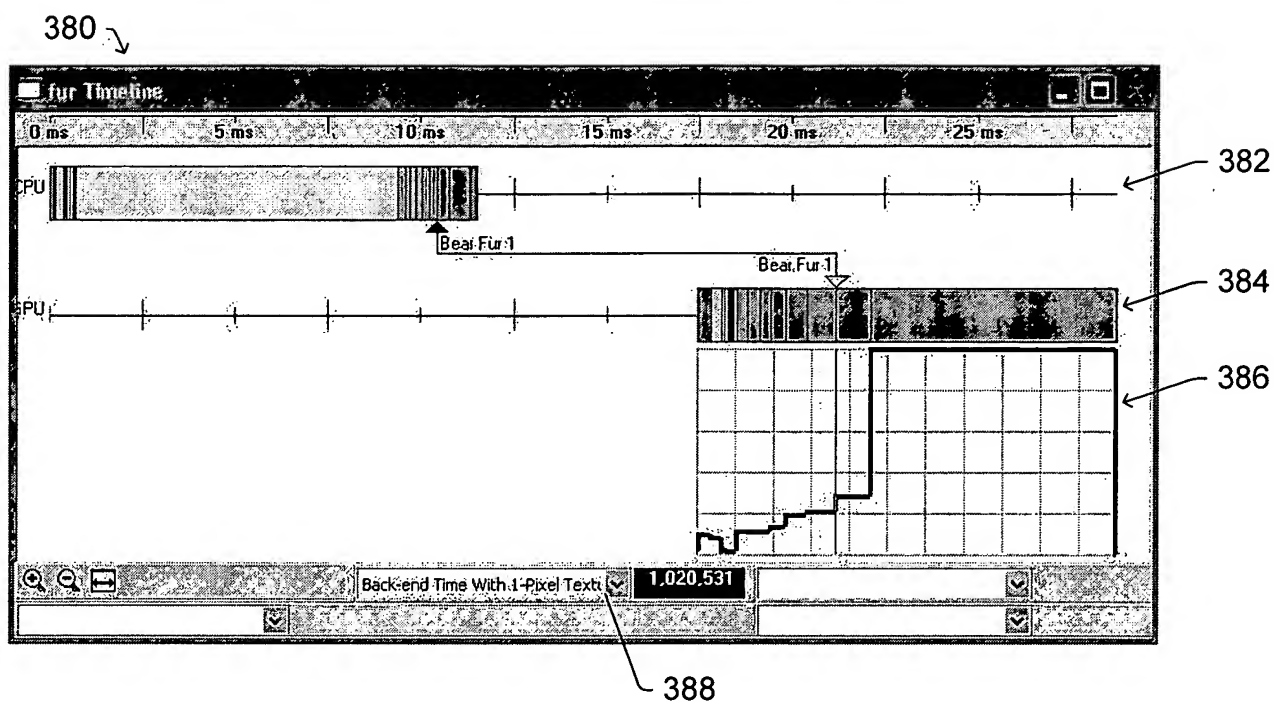


Fig. 8

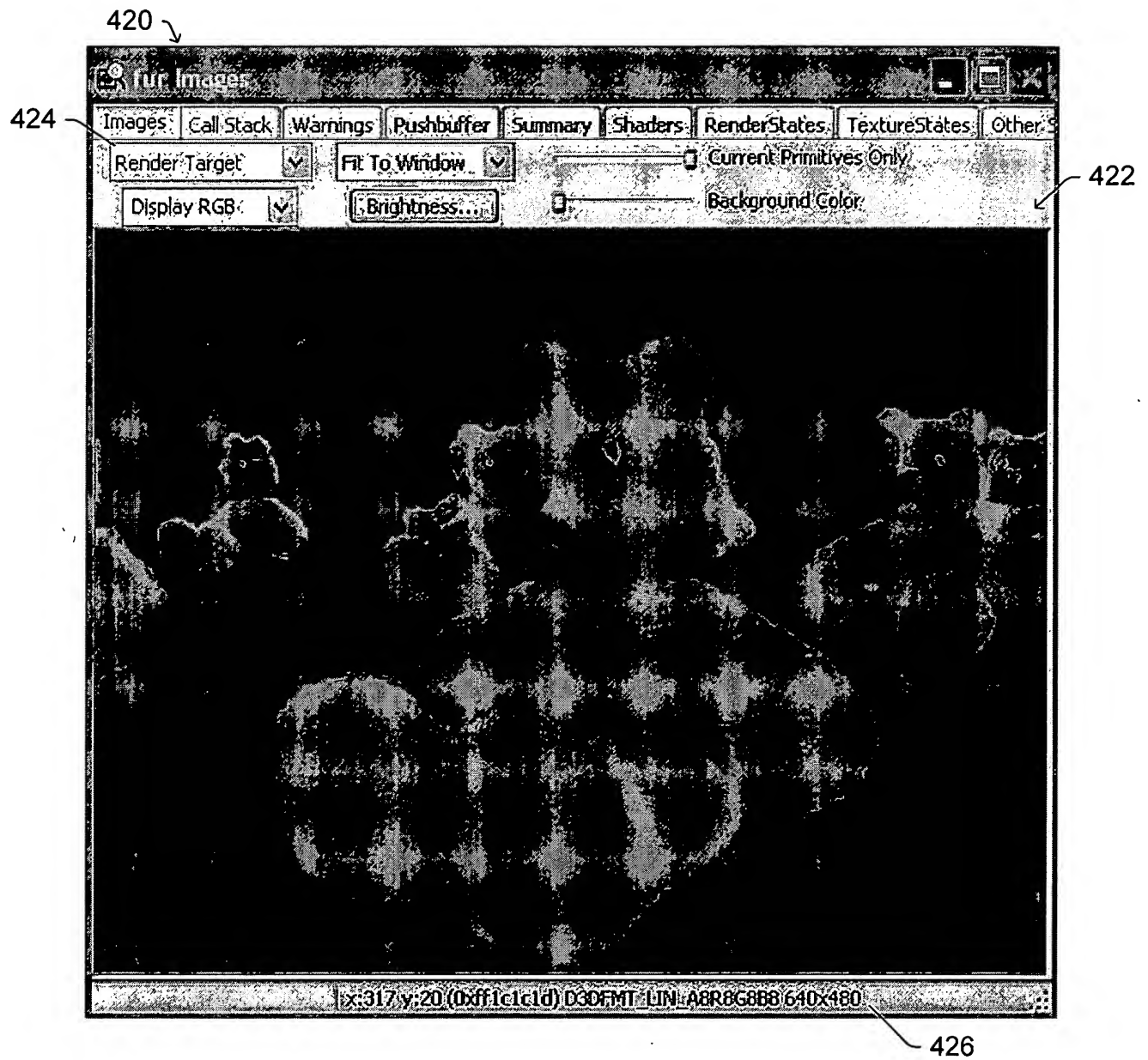


400 ↘

Event	ID	CPU Start (ns)	CPU Duration (ns)	GPU Start (ns)	GPU Duration (ns)	% of Total Time	Back-end Time (ns)	Setup Time (ns)
KickPushBuffer	0	0	14,449	-	-	-	-	-
FrameMove	1	36,612	101,750	-	0	-	-	-
Clear	3	144,537	4,698	15,745,863	48,640	-	-	-
Begin/End	4	181,781	29,929	15,794,503	331,584	-	-	-
Bear Mesh 0								
DrawIndexedVertices	6	252,563	125,782	16,126,087	278,176	-	-	-
KickPushBuffer	7	339,091	5,501	-	-	-	-	-
KickPushBuffer	8	374,790	3,385	-	-	-	-	-
DrawIndexedVertices	9	386,209	10,399	16,404,263	3,072	-	-	-
DrawIndexedVertices	10	401,332	6,393	16,407,335	2,656	-	-	-
Bear Mesh 1	11	409,555	56,960	16,409,991	45,568	-	-	-
Bear Mesh 2	15	466,773	39,522	16,455,559	74,208	-	-	-
Bear Mesh 3	19	506,536	91,996	16,529,767	59,072	-	-	-
Bear Mesh 4	25	598,778	53,437	16,588,839	47,232	-	-	-
Bear Mesh 5	29	652,769	39,348	16,636,071	47,552	-	-	-
Bear Mesh 6	33	692,356	37,207	16,683,623	45,248	-	-	-
Bear Mesh 7	37	729,799	92,051	16,728,871	50,783	-	-	-
Bear Fur 7								
DrawFins	44	852,610	122,595	16,779,656	156,932	-	-	-
DrawShells	73	975,455	40,536	16,936,616	61,407	-	-	-
Bear Fur 6	75	1,019,798	117,933	16,998,024	219,011	-	-	-
Bear Fur 5	107	1,138,001	7,341,552	17,217,064	224,739	-	-	-
Bear Fur 4	142	8,479,990	164,020	17,441,832	284,642	-	-	-

Fig. 9



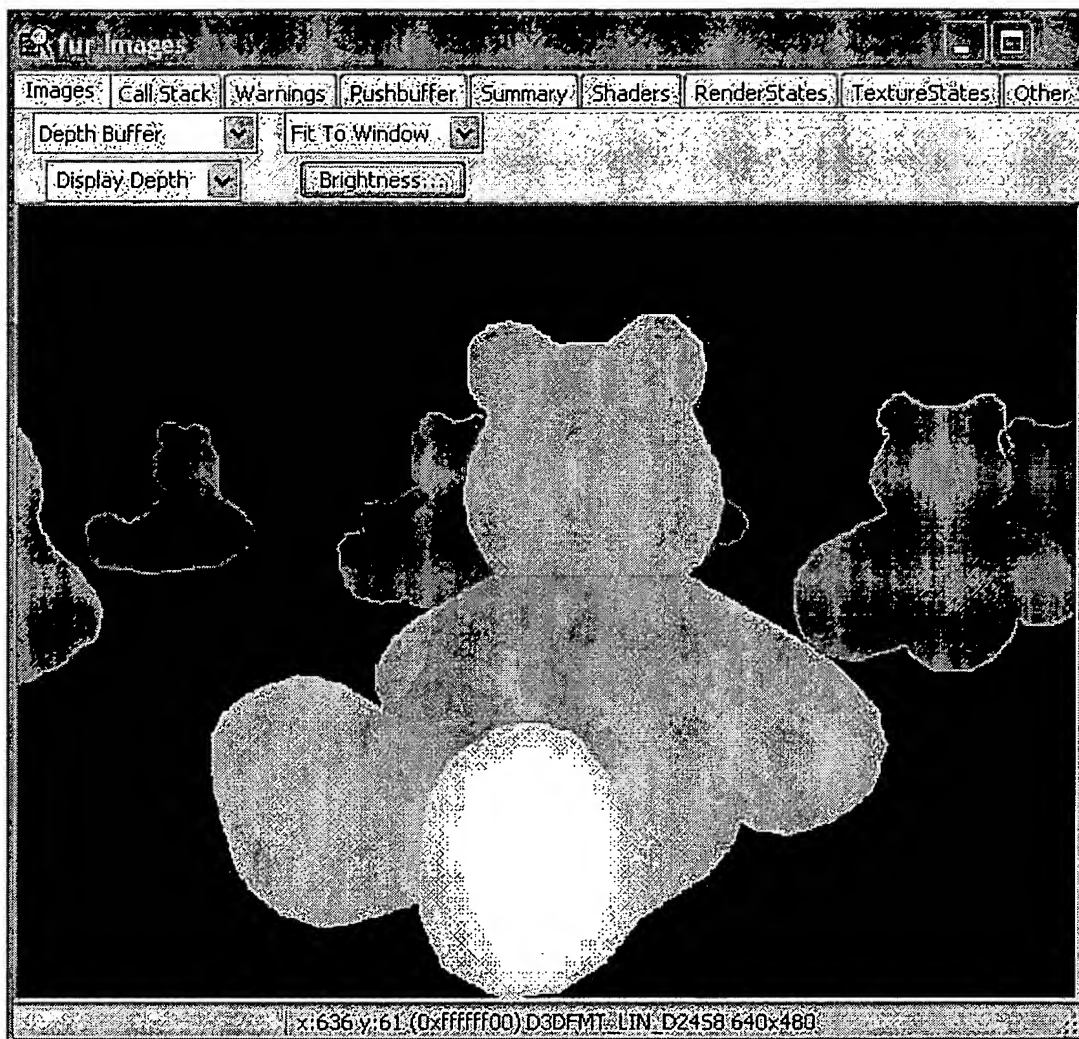


*Fig. 10*

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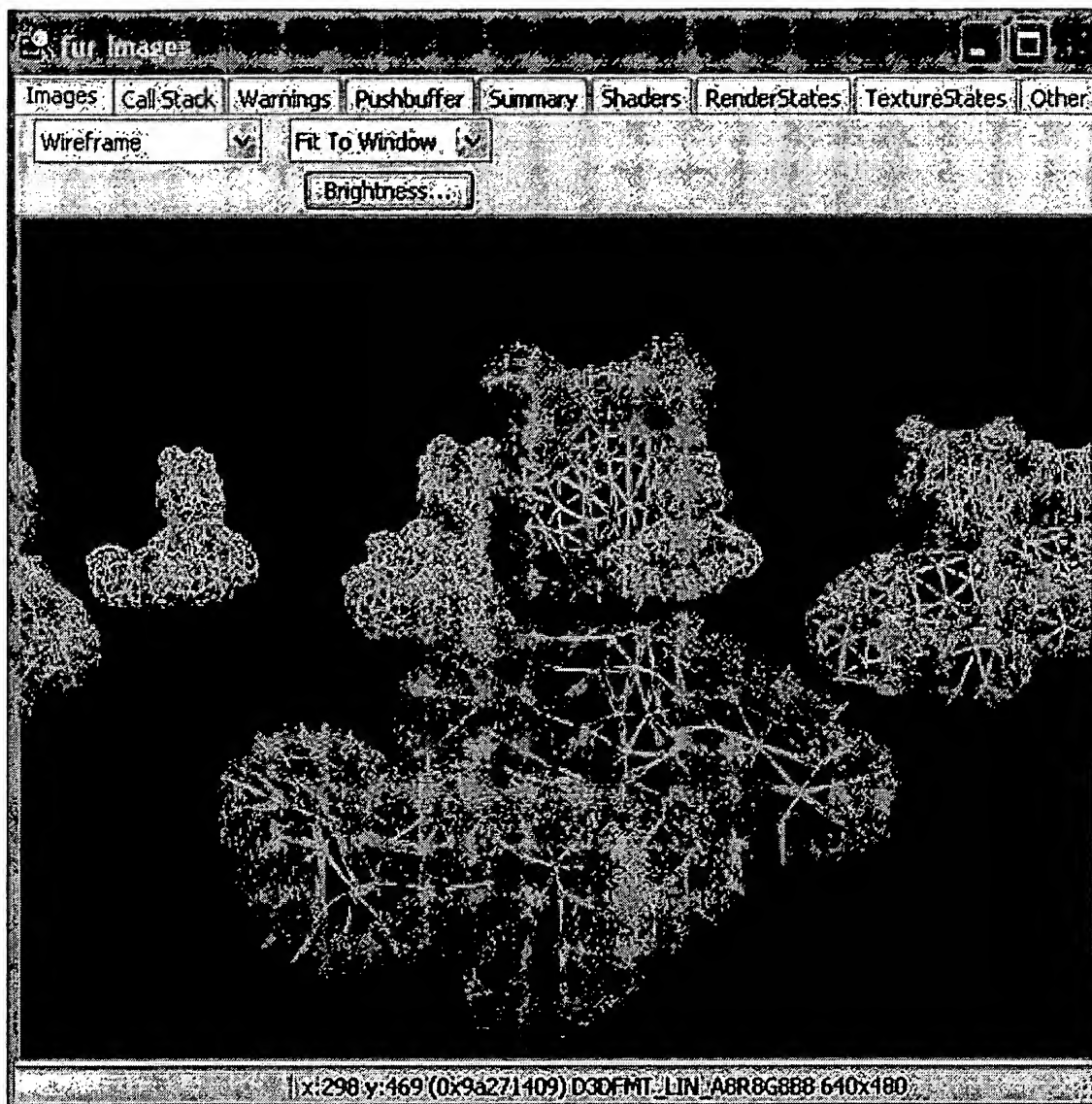


*Fig. 11*

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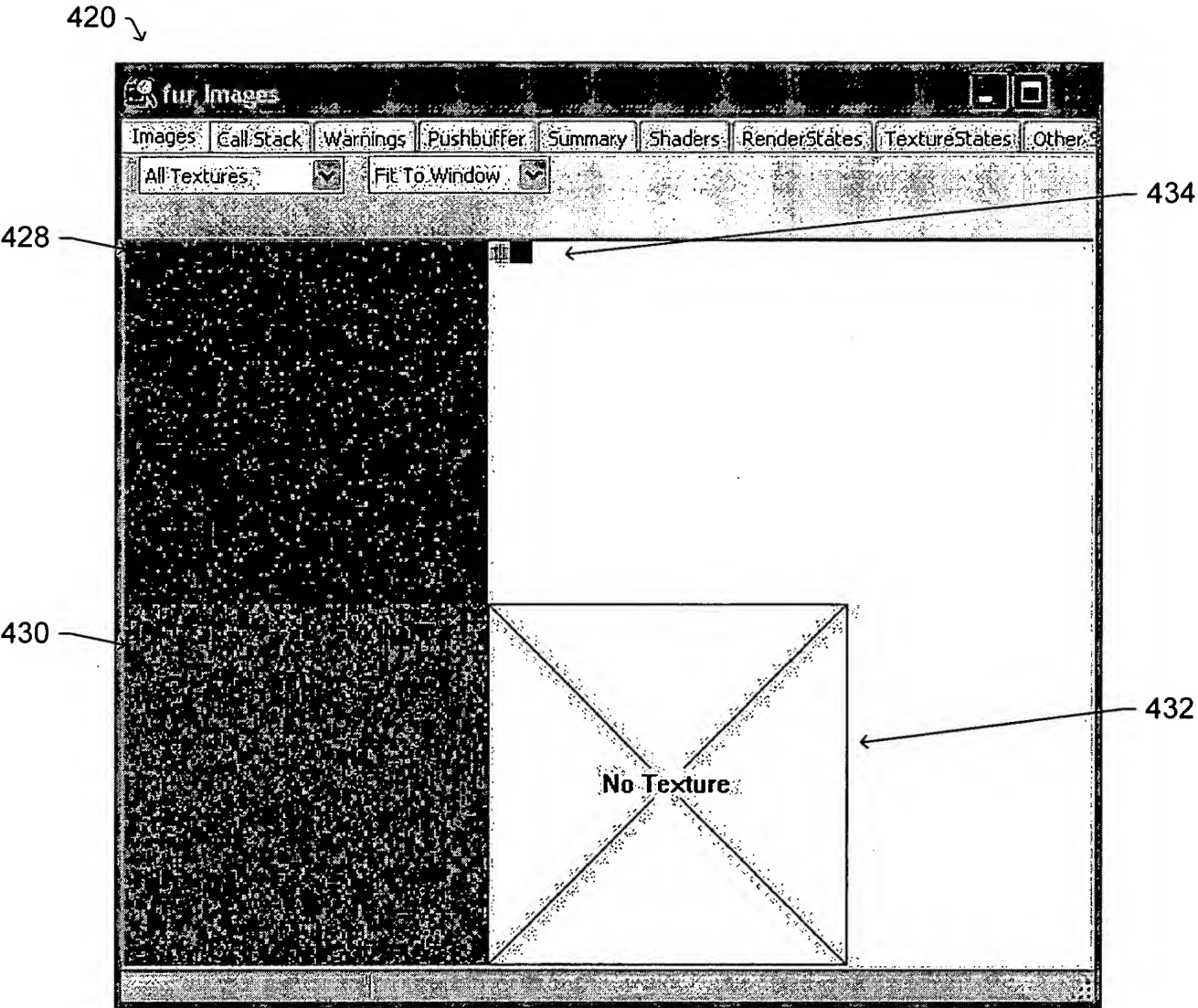


420 ↘



*Fig. 12*

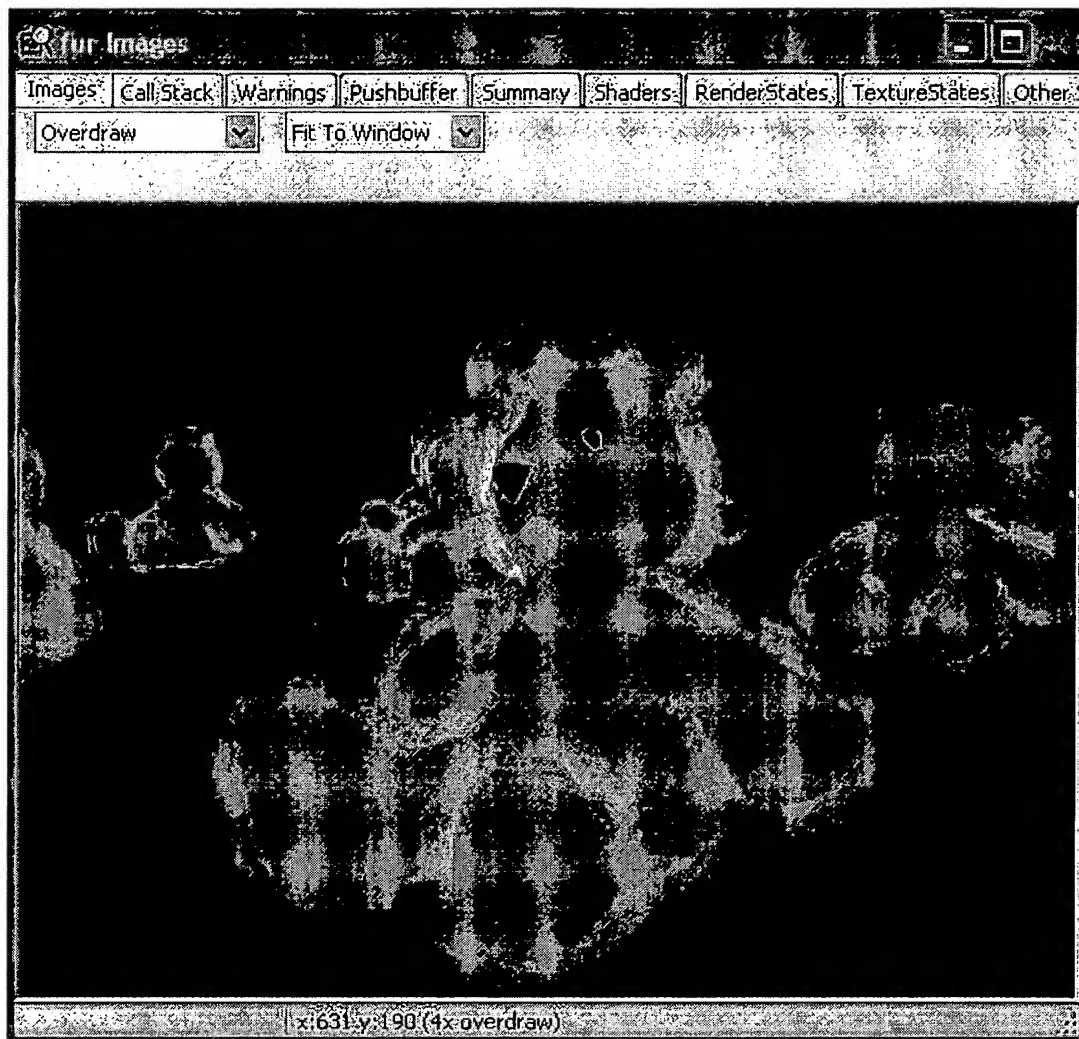
BEST AVAILABLE COPY



*Fig. 13*



420 ↘

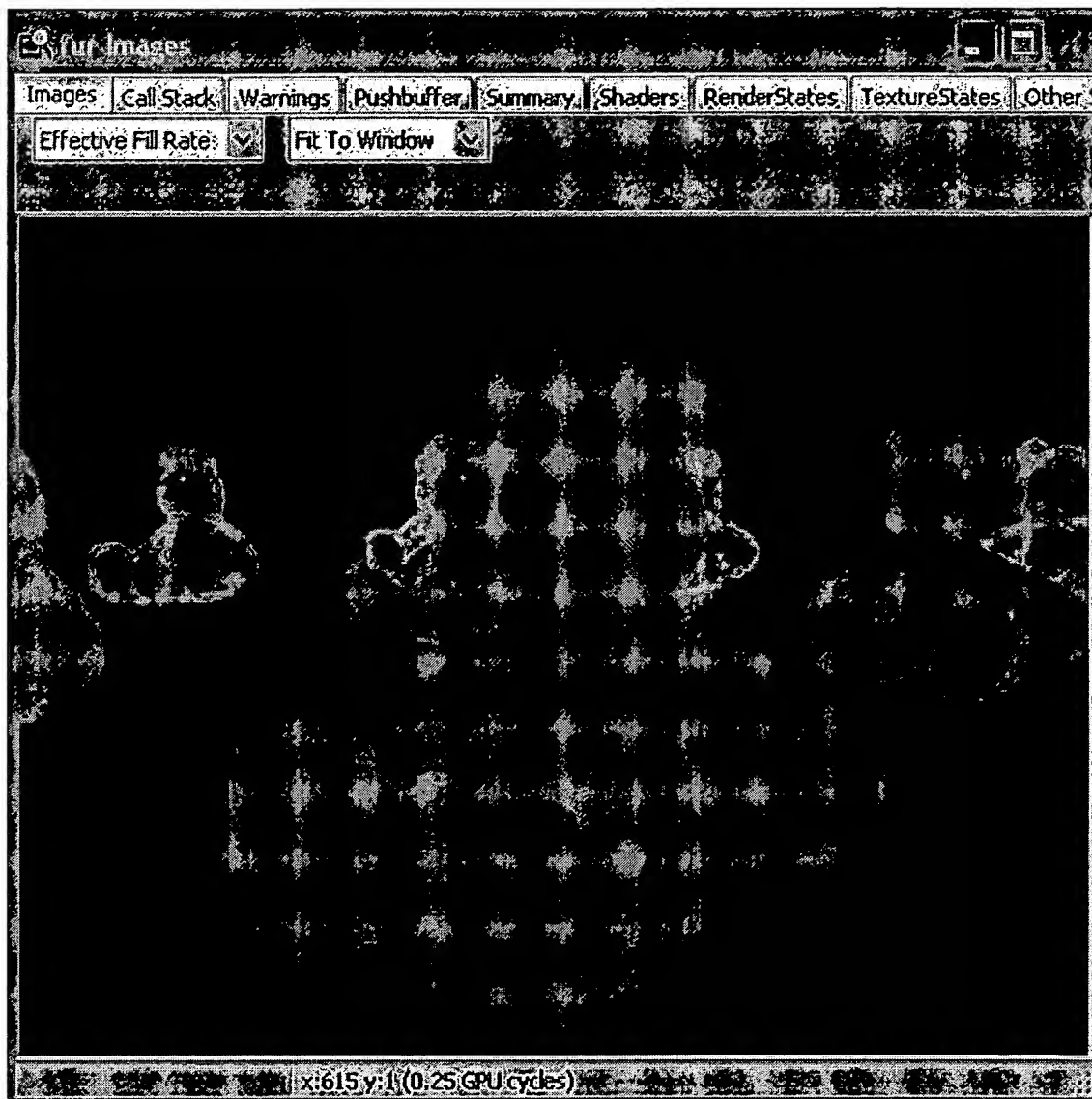


*Fig. 14*

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*Fig. 15*

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Docket No.: MS1-1705US  
Inventor(s): Kyle R. Johns and J. Andrew Goossen  
Title: User Interface for Facilitating Performance Analysis for Processing





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ID	Event	Priority	Message
3	Clear	3	If all redundant state setting were perfectly eliminated, rendering of entire scene would be 0.
		2	The CPU's floating point precision is set to 53 bits. Consider calling _controlfp_PC_24, _MC
4	Begin/End	3	Vertex shader is writing to 9 output registers that are unused by the current pixel shader.
		3	To make best use of pixel pipelines and swathing, use a single clipped triangle that covers th
74	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
106	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
138	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
173	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
206	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
210	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
243	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
247	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
280	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
282	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
284	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
288	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
321	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
325	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
329	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
333	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
336	Begin/End	2	D3DPRESENT_INTERVAL_ONE_OR_IMMEDIATE and D3DPRESENT_INTERVAL_TW

Fig. 17





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Pushbuffer Pushbuffer Disassembly			
Images Call Stack Warnings Pushbuffer Summary Shaders Render States Texture States Other State			
Event	Pushbuffer	Size	Attributes
BlockOnObject			
Clear	Clear(D3DCLEAR_TARGET   D3DCLEAR_ZBUFFER   D3DCLEAR_STENCIL)	28	
RunPushBuffer			
DrawVerticesUP	D3DRS_PSCOMBINERCOUNT	8	Redundant
	D3DRS_PSRGBINPUTS*	36	Redundant
	D3DRS_PSRGBOUTPUTS*	36	Redundant
	D3DRS_PSALPHAINPUTS	36	Redundant
	D3DRS_PSALPHAOUTPUTS*	36	Redundant
	LazySetShaderStageProgram	8	Redundant
	SetVertexShaderConstant	44	
	SetVertexShader/SelectVertexShader	208	
	LazySetSpecFogCombiner	8	Redundant
	D3DRS_PSFINALCOMBINERINPUTSABCD	8	
	D3DRS_PSFINALCOMBINERINPUTSEFG	4	
	LazySetState/SetVertexShaderInput	100	
	Jump:	4	
	D3DRS_CULLMODE	8	
	D3DRS_ALPHABLENDENABLE	532	
	SetVertexShaderConstant	76	
	SetVertexShader/SelectVertexShader	136	
	CommonSetViewport	52	Redundant
	SetVertexShader/SelectVertexShader	8	Redundant
	D3DRS_PSCOMBINERCOUNT	8	
	D3DRS_PSRGBINPUTS*	36	
	D3DRS_PSRGBOUTPUTS*	36	
	D3DRS_PSALPHAINPUTS*	36	

Fig. 18



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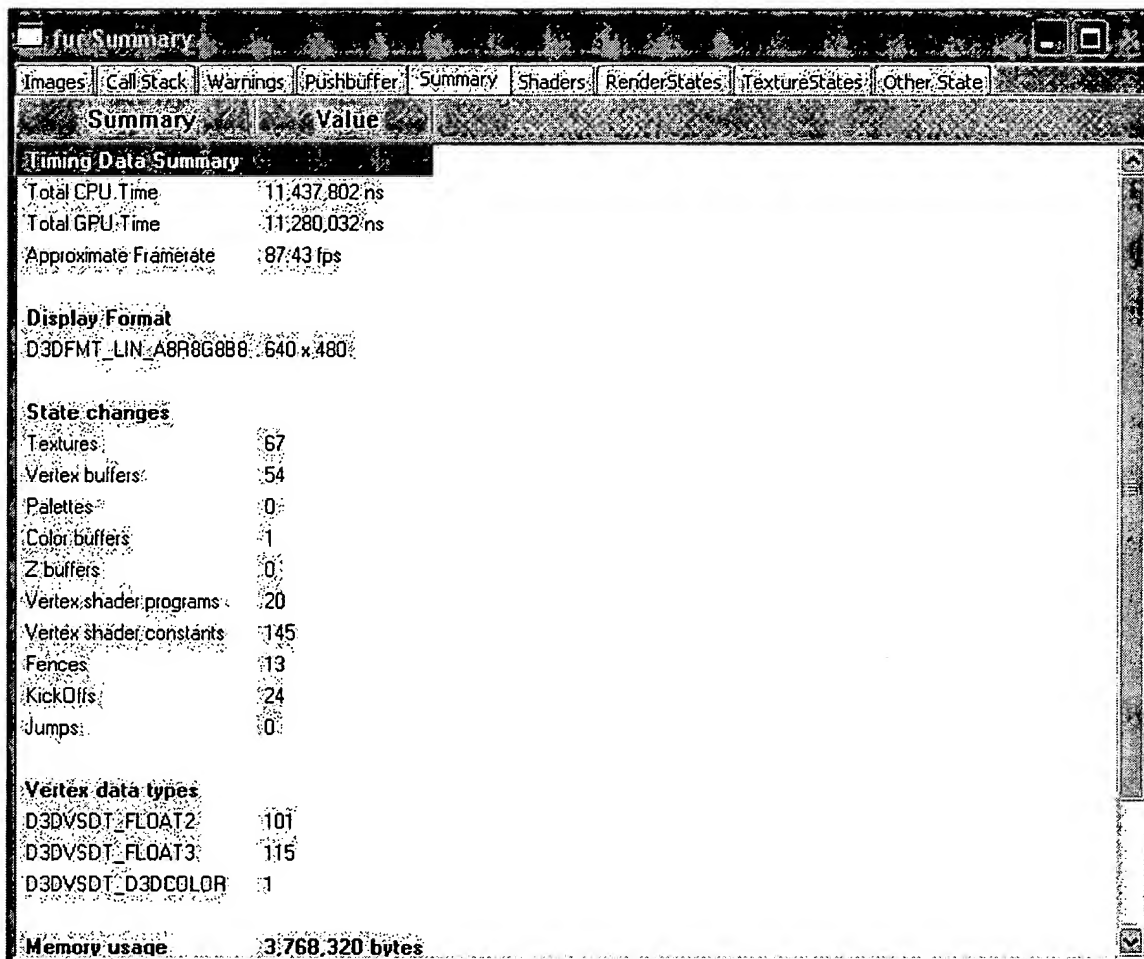
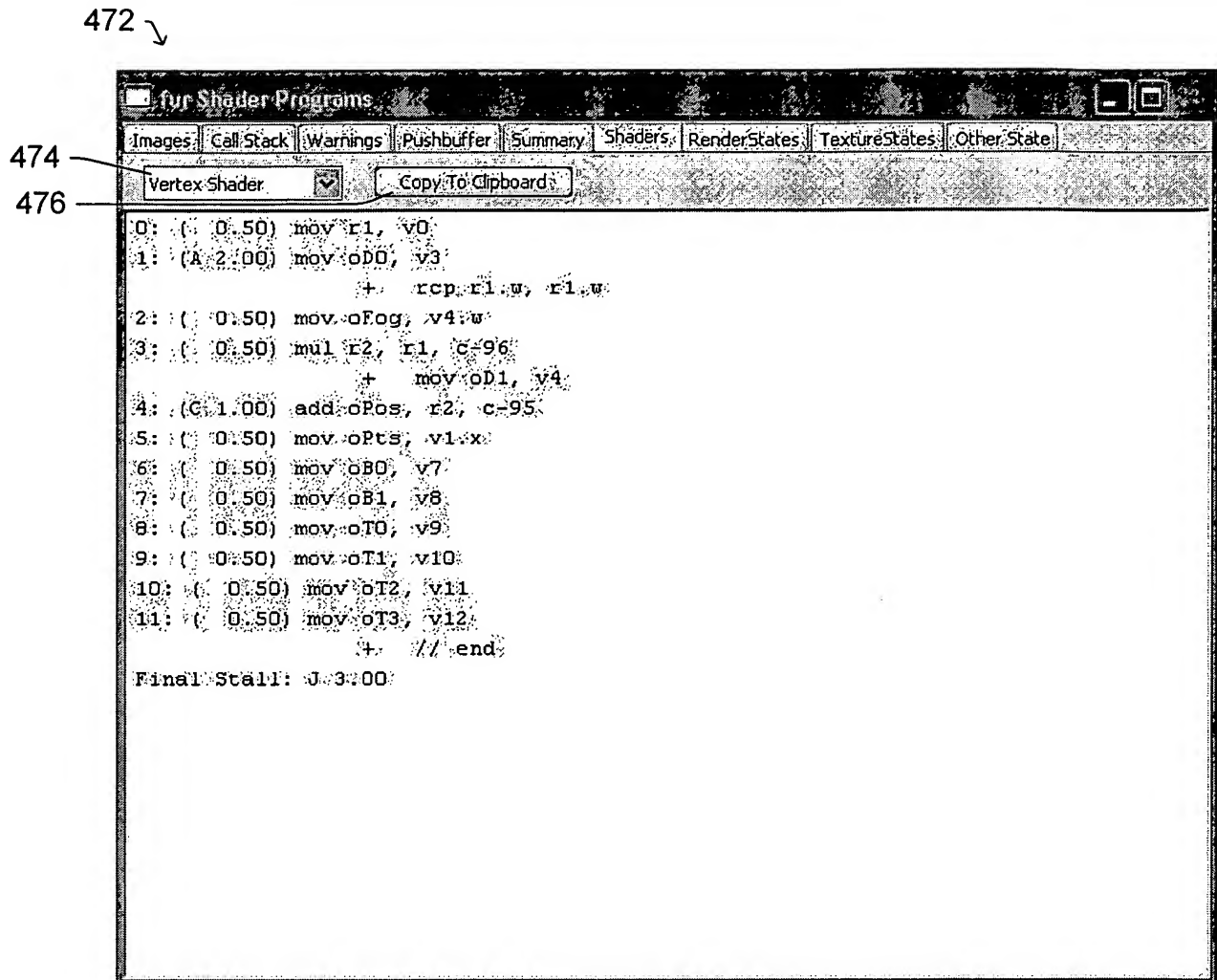


Fig. 19



*Fig. 20*



480 ↘

fur RenderStates	
Images	Call Stack
Warnings	Pushbuffer
Summary	Shaders
RenderStates	TextureStates
Other State	
RenderState	Value
D3DRS_ALPHABLENDENABLE	TRUE
D3DRS_ALPHAFUNC	D3DCMP_GREATEREQUAL
D3DRS_ALPHAREF	0x08
D3DRS_ALPHATESTENABLE	TRUE
D3DRS_BACKFILLMODE	D3DFILL_SOLID
D3DRS_BLENDCOLOR	0x00000000
D3DRS_BLENDOP	D3DBLENDOP_ADD
D3DRS_COLORWRITEENABLE	D3DCOLORWRITEENABLE_ALL
D3DRS_CULLMODE	D3DCULL_CCW
D3DRS_DEPTHCLIPCONTROL	D3DDCC_CULLPRIMITIVE
D3DRS_DESTBLEND	D3DBLEND_INVSRCALPHA
D3DRS_DITHERENABLE	FALSE
D3DRS_DONOTCULLUNCOMPRESSED	FALSE
D3DRS_DXT1NOISEENABLE	FALSE
D3DRS_EDGEANTIALIAS	FALSE
D3DRS_FILLMODE	D3DFILL_SOLID
D3DRS_FOGCOLOR	0x00000000
D3DRS_FOGDENSITY	?
D3DRS_FOGENABLE	FALSE
D3DRS_FOGEND	?
D3DRS_FOGSTART	?
D3DRS_FOGTABLEMODE	D3DFOG_NONE
D3DRS_FRONTFACE	D3DFRONT_CW
D3DRS_LIGHTING	FALSE
D3DRS_LINewidth	1.000
D3DRS_LOCALVIEWER	FALSE

Fig. 21



484 ↘

Texture State	Value
Texture Unit 0	
D3DTSS_ADDRESSU	D3DADDRESS_WRAP
D3DTSS_ADDRESSV	D3DADDRESS_WRAP
D3DTSS_ADDRESSW	D3DADDRESS_WRAP
D3DTSS_ALPHAKILL	D3DTALPHAKILL_DISABLE
D3DTSS_BORDERCOLOR	0x00000000
D3DTSS_BUMPENVLOFFSET	-
D3DTSS_BUMPENVLSCALE	-
D3DTSS_BUMPENVMAT00	-
D3DTSS_BUMPENVMAT01	-
D3DTSS_BUMPENVMAT10	-
D3DTSS_BUMPENVMAT11	-
D3DTSS_COLORKEY	0x00000000
D3DTSS_COLORKEYOP	D3DTCOLORKEYOP_DISABLE
D3DTSS_COLORSIGN	0
D3DTSS_MAGFILTER	D3DTEXF_LINEAR
D3DTSS_MAXANISOTROPY	0
D3DTSS_MAXMIPLEVEL	0
D3DTSS_MINFILTER	D3DTEXF_LINEAR
D3DTSS_MIPFILTER	D3DTEXF_LINEAR
D3DTSS_MIPMAPLODBIAS	0.000
D3DTSS_TEXCOORDINDEX	?
D3DTSS_TEXTURETRANSFORMFLAGS	?
Texture Unit 1	
D3DTSS_ADDRESSU	D3DADDRESS_WRAP

Fig. 22



488 ↘

State	Value
Color buffer	640x480, D3DFMT_LIN_A8R8G8B8, address 0x3d04000, pitch 0xa00
Depth buffer	
Color tile	Tile 0, address 0x3d04000, pitch 0xa00, size 0x258000
Depth tile	
Scissors	Inclusive: (0, 0, 640, 480)
Depth clip planes	0.0, 16777215.0
VisibilityTest	FALSE
Texture 0	Texture 128x256, D3DFMT_A4R4G4B4, address 0x3bc8000
Texture 1	
Texture 2	
Texture 3	
Stream v0	D3DVSDT_FLOAT3, address 0x3a9b000, pitch 0x10
Stream v1	
Stream v2	
Stream v3	D3DVSDT_D3DCOLOR, address 0x3a9b00c, pitch 0x10
Stream v4	
Stream v5	
Stream v6	
Stream v7	
Stream v8	
Stream v9	
Stream v10	
Stream v11	
Stream v12	
Stream v13	
Stream v14	

*Fig. 23*



500

GPU Debugger Pixel <350,256>

Close <- Back Copy Text to Clipboard Copy Window Image to Clipboard

## Pixel History

All GPU operations affecting pixel <350,256> on the current render target up to and including event 290: Bear Fur 0/12 operations.

The gamma ramp set for the Render Target in the Images Window is used to display colors in this window.

**Initial framebuffer values**

Initial framebuffer color: 0xff3b2a26  
Initial framebuffer depth: 13656823:000000  
Initial framebuffer stencil: 0x00

**Event 3: Clear**

Framebuffer depth after clear: 16777215:000000  
Framebuffer stencil after clear: 0x00

**Event 4: Begin/End Primitive 0**

Pixel shader output color: 0xff353542  
Framebuffer color after blend: 0xff353542

**Event 6: Bear Mesh 0/DrawIndexedVertices Primitive 1430**

Pixel shader output color: 0xff3b2a26  
Pixel shader output depth: 13646101:000000  
Framebuffer color after blend: 0xff3b2a26  
Framebuffer depth after blend: 13646101:000000  
Framebuffer stencil after blend: 0x00

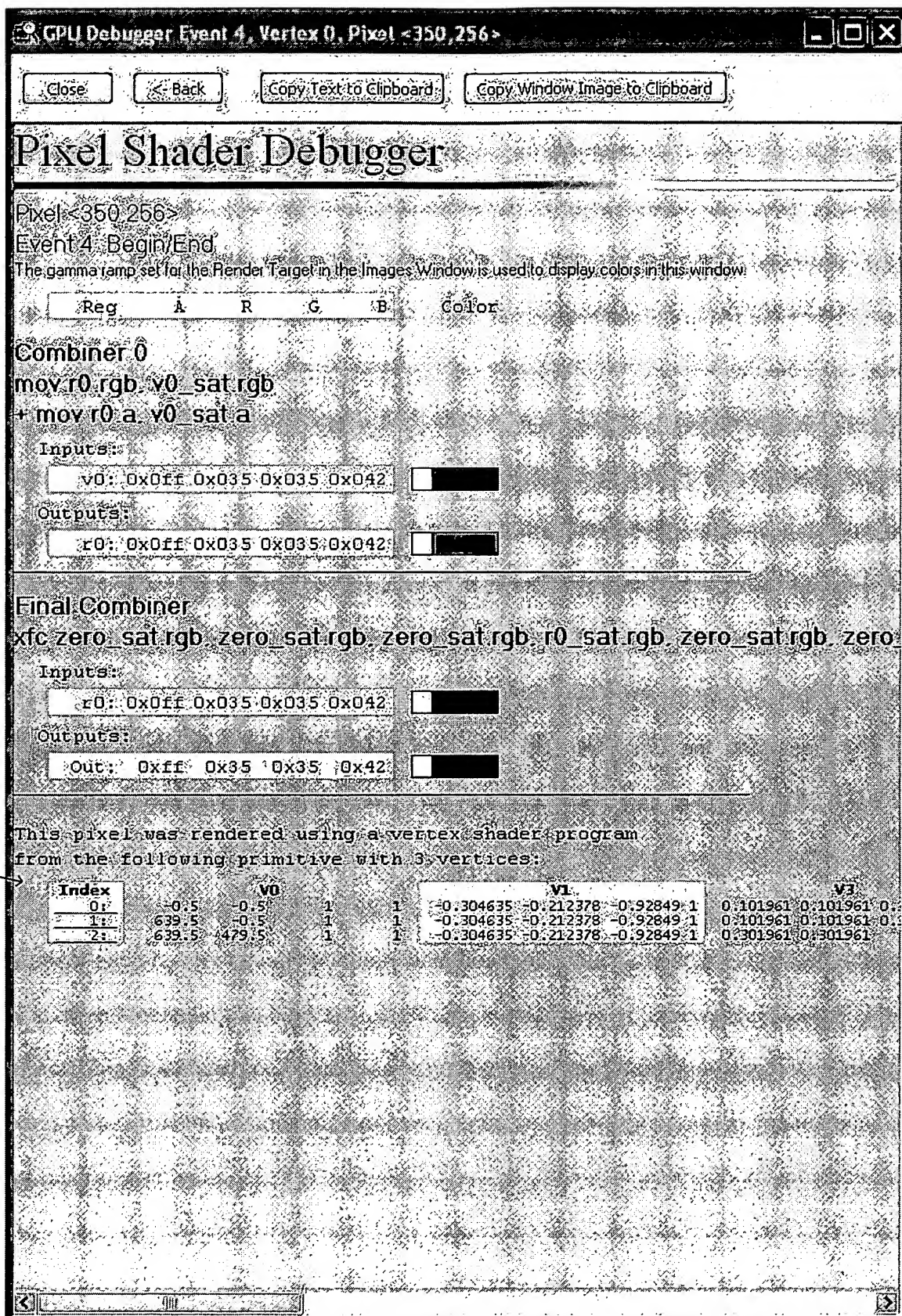
**Event 321: Bear Fur 0/DrawShells/DrawIndexedVertices Primitive 1419**

Fig.  
24





520



522

Fig. 25





540 ↘

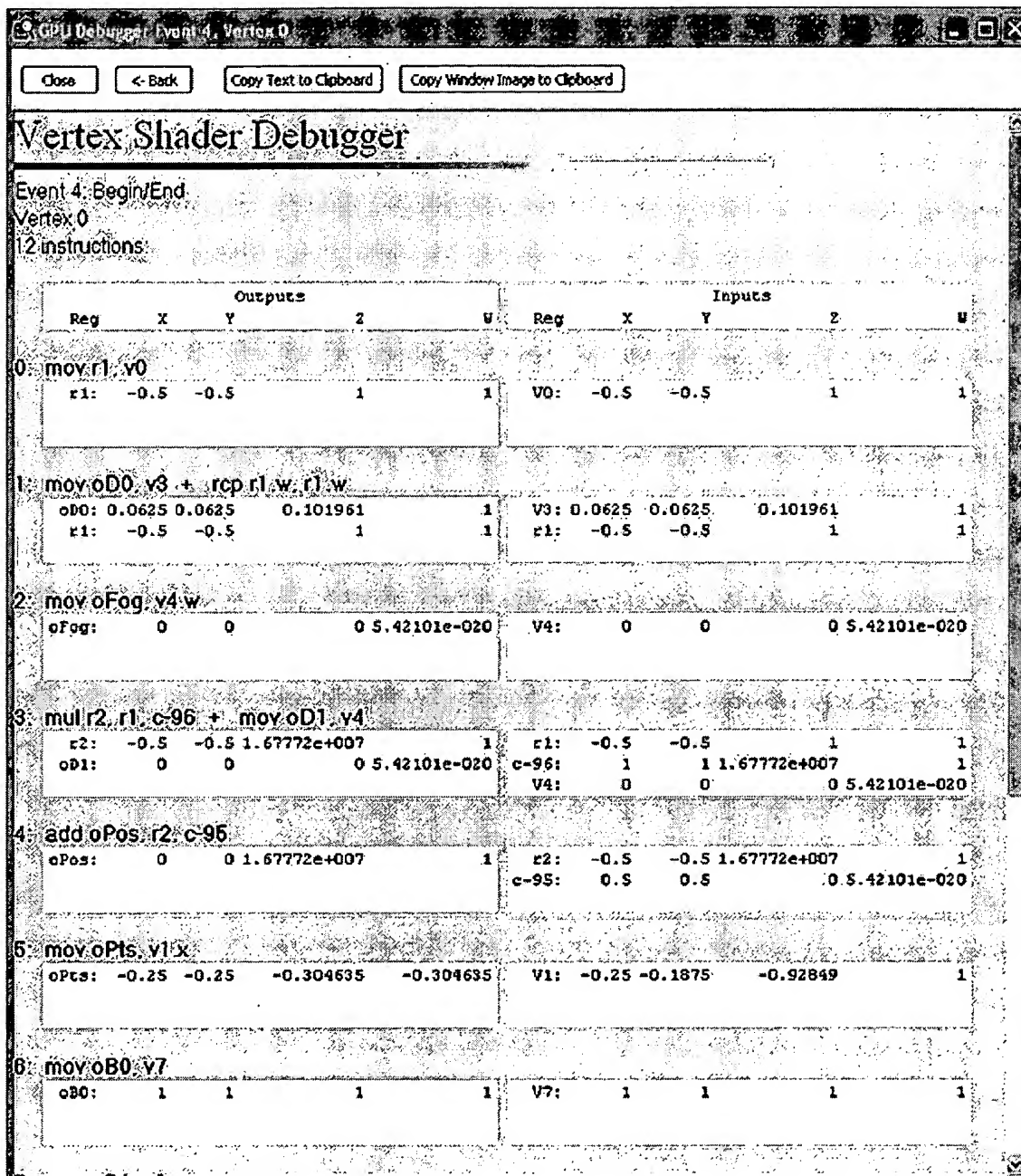


Fig. 26

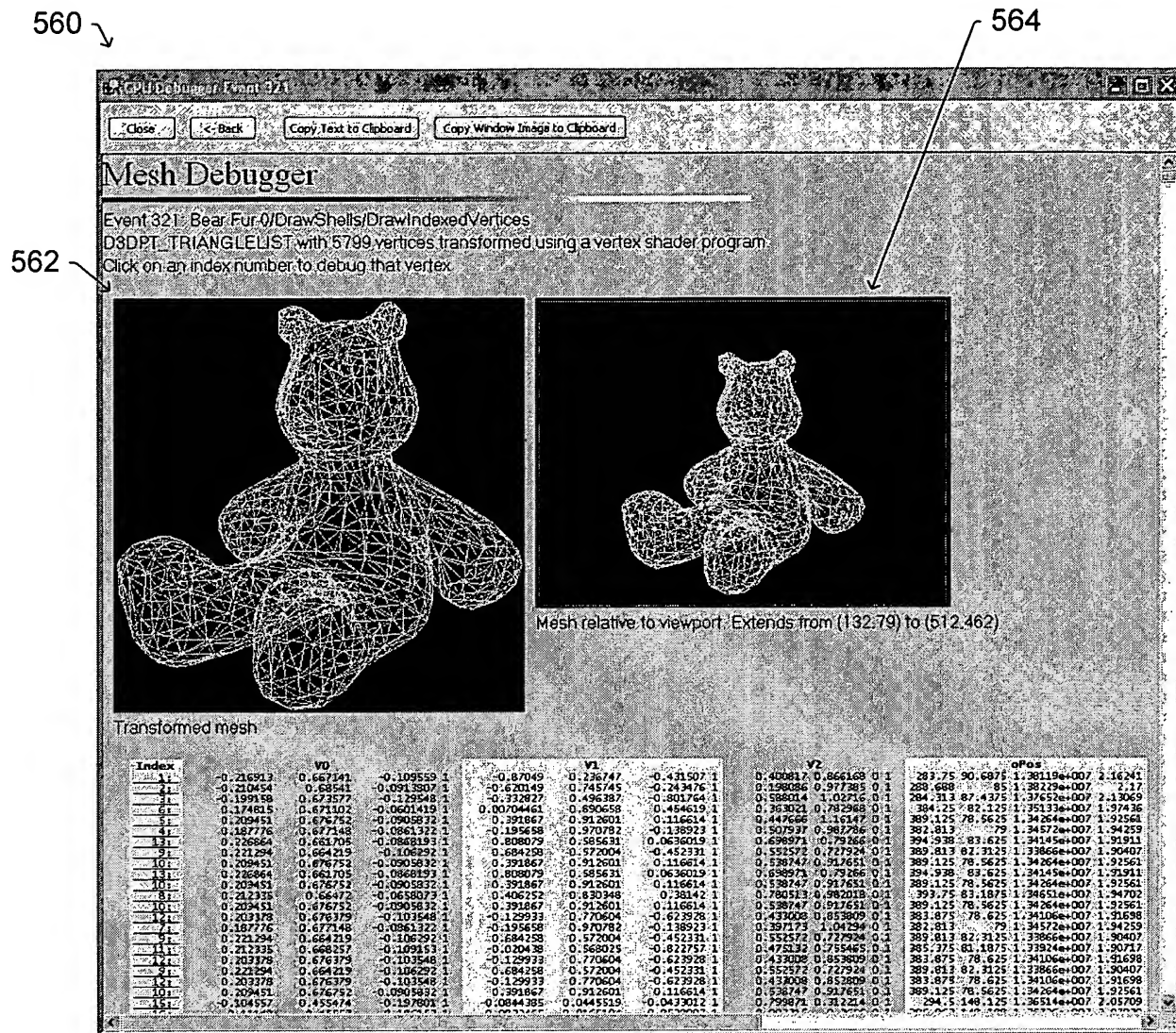


Fig. 27

